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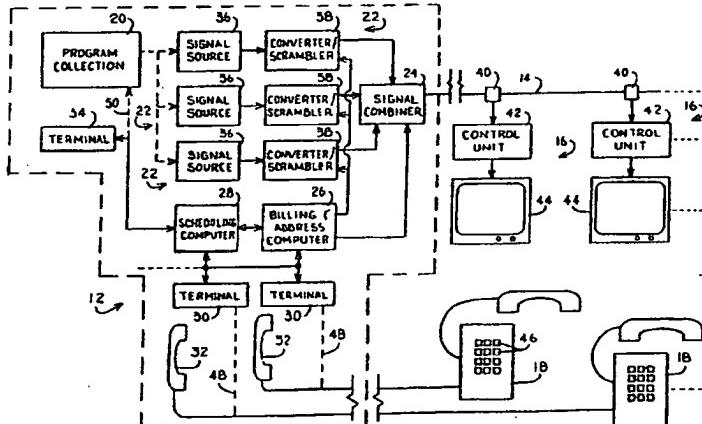
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 4 :	A1	(11) International Publication Number: WO 89/12370
H04N 7/167		(43) International Publication Date: 14 December 1989 (14.12.89)
(21) International Application Number:	PCT/US89/02507	(81) Designated States: AT (European patent), AU, BE (European patent), CH (European patent), DE (European patent), FR (European patent), GB (European patent), IT (European patent), JP, LU (European patent), NL (European patent), SE (European patent).
(22) International Filing Date:	8 June 1989 (08.06.89)	
(30) Priority data:	204,585 9 June 1988 (09.06.88) US	Published <i>With international search report.</i>
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(54) Title: TELEVISION BROADCAST SYSTEM FOR SELECTIVE TRANSMISSION OF VIEWER-CHOSEN PROGRAMS AT VIEWER-REQUESTED TIMES

(57) Abstract

A television broadcast system using land lines (14) is provided for real-time transmission of a viewer-chosen program at a viewer-requested time to the requesting viewer's television receiver (16). The preferred method includes the steps of providing a collection of stored programs (20), communicating the requesting viewer's choice of a program chosen from the collection (20) and a requested time for viewing the chosen program, selecting the chosen program from a collection (20), transmitting the chosen program at the requested time for viewing on the requesting viewer's receiver (16), and preventing intelligible viewing of the chosen program on other of the receivers (44), other than that which specifically requested the program selection. The preferred system (10) includes a central unit (12), land lines (14), a plurality of viewer-associated receivers (16), and a plurality of viewer-associated telephone handsets (18). Customers can communicate with customer service representative at telephone units (32) at the central station (12). Alternatively, customers can use their telephones (18) to communicate directly with the scheduling computer (28). The signal sources (36), the converter/scramblers (38), and the signal combiner prepare the plurality of requested programs for transmission over land line (14). Billing and addressing is controlled by billing and address computer (26).



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TELEVISION BROADCAST SYSTEM FOR  
SELECTIVE TRANSMISSION OF VIEWER-CHOSEN  
PROGRAMS AT VIEWER-REQUESTED TIMES

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Background of the Invention

1. Field of the Invention

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The present invention relates to a community antenna television (CATV) system. More particularly, the present invention relates to a system in which a viewer can choose a program and request a time for viewing of the chosen program on the viewer's television receiver.

15

2. Description of the Prior Art

With over half the homes in the United States now equipped with video cassette recorders, a major industry has developed which includes thousands of video stores for renting movies and other programs on video cassettes in order to satisfy a demand for over three billion rentals a year. One of the reasons video tape cassette rentals have become so popular is that the viewer can rent a desired program cassette from the video store's assortment and then view that program whenever desired. This is in contrast to conventional broadcast television or premium cable television in which the viewer neither chooses the program being transmitted nor the time at which it is transmitted.

20

25

Even with the advantages of cassette rental, certain problems are apparent. For example, the viewer must make a first round-trip to the video store to pick up the desired program cassette and then make a second round-trip to return the cassette. Additionally, the viewer may make a trip to the video store only to find that the movie is unavailable either because all of the available

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1 copies have already been rented, or that particular  
video store does not stock the desired movie. If  
such occurs, not only is the viewer inconvenienced,  
but the video store also loses potential rental  
5 revenue.

Furthermore, the existing system for  
renting video cassettes presents some inherent  
inefficiencies. For example, in order to minimize  
inconvenience to the customer, the video store must  
10 be located at a premium, high rent, location such as  
a corner intersection or a shopping mall and pay the  
high rent associated with the premium location.

Second, each video store must carry a  
complete library of video taped programs most of  
15 which are unused at any given time. For example, it  
a video tape store may carry an inventory of over  
5,000 program titles representing thousands more  
video cassettes owing to the duplication of many of  
the titles. The inventory problem is magnified if  
20 duplicate cassettes are stocked in VHS and BETA  
formats. At any given time, however, only a rela-  
tively small percentage of the titles will be rented  
which are typically the currently most popular pro-  
grams. Even with such a large inventory, the video  
store can satisfy relatively few requests for the  
25 most popular programs. That is to say, even if a  
number of copies of a currently popular program are  
in stock, the demand for this program may far exceed  
this number of copies and potential revenue is lost  
while other titles lie idle.

30 Third, the inventory problem for video  
rental stores is a growing one in that new titles  
are released to the video market each month with the  
result that the number of titles in a video store's  
inventory grows by at least this amount each month.

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1       The physical space required to store these additional titles may grow at an even faster rate because more than one copy of each title may be purchased.  
5       In order to handle the ever increasing number of cassettes, the video store must increase its storage capacity for which it must pay a higher rent because of the store's premium location.

10      In order to solve some of the problems associated with the video cassette rental industry, various prior art solutions have been proposed. For example, Patent No. 4,506,387 which is hereby incorporated by reference discloses a system in which a cable television system (CATV) may download a recording from a central location over its cable trunk line to a memory module included in the viewer's television receiver. The program is downloaded in non-real time, typically in about 30 seconds, and the viewer then activates the memory module to view the program stored therein. The '387 patent presents some disadvantages, however, in that the central location must be equipped to download the program in non-real time. Additionally, each viewer's receiver must be equipped with a memory module to store the downloaded program. Such equipment may be prohibitively expensive and may be also inefficient in that a viewer's receiver must be properly equipped even though a particular viewer may seldom, if ever, desire to take advantage of the capability.

20      Patent No. 4,381,522 which is hereby incorporated by reference discloses a system in which a viewer can telephone the cable company's central location and electronically select a specialized recording such as a commercial advertisement for broadcast over one of the unused channels of the cable television system. A computer then

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1 schedules the program, transmits it at the scheduled time, and separately transmits a directory of all of the scheduled programs on another unused channel. The viewer then observes the directory channel to see when the requested recording is scheduled, and then turns to the channel indicated at the scheduled time to view the program. The provision of the directory channel encourages other viewers to view one of the scheduled recordings also. The system as 10 disclosed in the '522 patent does not allow the viewer to determine when the program is to be scheduled and furthermore provides no means by which receivers other than the one of the requesting viewer are prevented from viewing the scheduled 15 program.

Summary of the Invention

The present invention solves the problems as outlined above. The invention hereof allows a viewer to choose a program from a collection and to view that program at a viewer-requested time on the viewer's receiver for which the viewer is billed and which also prevents non-requesting viewers from intelligible viewing of the chosen program on their associated receivers. This allows a viewer to "rent" a program without the need for a VCR. 20 25

The present invention is advantageously and preferably implemented in the context of a television transmission system, typically a CATV system, which uses land lines such as coaxial cables or fiber optic cables for transmitting programs to a plurality of subscriber's receivers. Preferably, the television transmission system is an "addressable" system in which selected programs are scrambled to prevent intelligible viewing thereof and in 30

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1        which a descrambling signal can then be addressed to  
the receiver associated with the requesting viewer  
which in turn prompts the included control unit to  
descramble the program transmission for viewing on  
5        that receiver.

10      The preferred method of the present invention involves the steps of providing a collection of stored programs, selecting a program chosen from the collection for transmission at a requested time in response to a request from a viewer, transmitting the chosen program in real-time over the system's land lines at the requested time, and preventing intelligible viewing of the chosen program at the requested time by receivers other than the requesting viewer's receiver. More particularly, the preferred method includes the steps of scrambling the transmission of the chosen program and transmitting decoder signals to the requesting viewer's receiver in order to allow intelligible viewing of the chosen program thereon only by the requesting viewer and thereby preventing intelligible viewing by others.

15      Additionally, the preferred method also includes the steps of transmitting the chosen program at the requested time over a selected channel and communicating the identity of the selected channel only to the requesting viewer.

20      In preferred forms, the method hereof includes the steps of transmitting address signals specific to the control unit associated with the requesting viewer and transmitting associated descrambler signals specific to the selected channel over which the chosen program is being transmitted.

25      Advantageously, the preferred method includes the steps of identifying a section of the

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1 land lines having a subset of receivers operably  
coupled thereto, transmitting the chosen program  
over the section of the land lines, identifying a  
5 juncture between the section and the remaining  
portion of the land lines, and preventing transmis-  
sion of the chosen program therebeyond by use of a  
blocking device located at the juncture.

10 The preferred apparatus includes a collec-  
tion of stored programs, means for selectively  
choosing certain ones of the programs for transmis-  
sion, means for transmitting a chosen program at a  
requested time, and a scheduling computer for sche-  
duling program choices and requested times. The  
15 preferred apparatus also includes computer means for  
receiving information from the requesting viewer as  
encoded signals preferably over telephone lines  
using telephone touch-tones. In especially prefer-  
red forms, the computer means is equipped for voice  
communication with the requesting viewer either in  
the form of synthetically generated voice signals or  
20 prerecorded selected messages.

Other preferred aspects of the present  
invention are explained hereinbelow.

Brief Description of the Drawing Figures

25 Figure 1 is schematic illustration of the  
preferred configuration of the present invention;

Fig. 2 is a schematic illustration showing  
the preferred interconnection between the configura-  
tion of Fig. 1 and sections of the transmission  
30 system.

Detailed Description of the Preferred Embodiments

The present invention is preferably imple-  
mented in the context of a conventional community

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1 antenna television (CATV) system, the equipment and  
operation of which are well understood by those  
skilled in the art and which are explained in part  
in the Electronics Engineer's Handbook, Second  
5 Edition, which is hereby incorporated by reference.

Preferred system 10 (Figs. 1) includes  
central unit 12, land lines 14, a plurality of  
viewer-associated receivers 16, and a plurality of  
viewer-associated telephone handsets 18.

10 Central unit 12 includes program collection 20, a plurality of signal transmitters 22, signal combiner 24, billing and address computer 26, scheduling computer 28, a plurality of input data computer terminals 30 having associated telephone units 32, and output schedule computer terminal 34.

15 Program collection 20 includes a plurality of programs stored on a medium allowing selective reproduction and real-time transmission thereof over land lines 14 for reception by and viewing on receiver 16 by an associated viewer. Preferably, the programs stored in collection 20 are stored on 3/4" video tape which allows for higher fidelity reproduction than conventional 1/2" video tape. Each program is preferably assigned and labeled with a catalog number, a list of which is stored in scheduling computer 28. Preferably, up to three copies of selected programs are included in collection 20 which to allow continuous transmission of ninety-minute programs at half-hour intervals if desired for currently popular programs.

20 As those skilled in the art will appreciate, the programs in collection 20 can be stored on a variety of media including compact disks, floppy disks, hard disks, conventional magnetic tape, electronic memory such as that disclosed in U.S. Patent

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1 No. 4,506,387, or the like. While storage on video tape is preferred, available technology and economic factors may dictate an alternative storage medium.

5 Signal transmitters 22 are conventional units commonly found in the "head end" of a typical CATV system. Signal transmitter 22 includes signal source 36 and converter/scrambler unit 38.

10 Signal source 36 in a typical CATV system is the origination point for signals received by way of antenna, microwave, land lines from a local television station, or a video cassette recorder (VCR). Preferred signal source 36 includes a 3/4" video cassette recorder (VCR) operable to receive and play video cassettes selected from collection 20 and to produce signals representative thereof for presentation to converter/scrambler unit 38.

15 Conventional converter/scrambler unit 38 receives signals from signal source 36 and converts those signals for output on a predetermined frequency channel. In a conventional system, these channels include low band, mid-band, high band, super band, and hyper band, which, depending upon the design of the system, may allow selection of up to seventy different channels for program transmission on a single coaxial cable trunk line. In the preferred system, unit 38 is operable to selectively scramble program transmissions.

20 Conventional signal combiner 24 receives the output signals from transmitters 22 on the various channels and combines those signals for transmission over land lines 14. Signal combiner 24 is also typically coupled with conventional billing and address computer 26.

25 Computer 26 is operable to transmit decoder signals by way of signal combiner 24 onto land

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1       lines 14 and thereby to receivers 16 which allows  
intelligible viewing of scrambled program transmis-  
sion on selected ones of receivers 16 and prevents  
intelligible viewing on others. That is to say,  
5       computer 16 keeps track of which viewers which have  
subscribed to certain premium channels such HBO, and  
periodically transmits decoder signals which include  
address signals specific to receivers 16. Descram-  
bling signals are typically associated with the  
10      address signals which prompts the addressed receiver  
16 to descramble the transmissions identified by the  
associated descrambler signals. Receivers 16 which  
do not receive descrambling signals associated with  
their respective address signals prevent intelli-  
gible viewing of the scrambled program transmission.  
15

Computer 26 is also operable for producing  
billing information as appropriate for the services  
to which the individual viewers have subscribed. As  
those skilled in the art will appreciate, the vari-  
ous functions performed by computer 26 may be per-  
20      formed by separate computers.

Scheduling computer 28 is preferably a  
minicomputer and is operably coupled with terminals  
30, with computer 26, and with terminal 34. As will  
be explained further hereinbelow, computer 28 re-  
ceives data representative of the program choices  
25      and requested times for viewing thereof and presents  
outputs at terminal 34 whereby the chosen program  
can be selected from collection 20 for transmission  
by the respective signal transmitter 22 at the  
30      requested time.

In one embodiment, viewers communicate  
their program choices and requested viewing times by  
way of conventional telephone handsets 18 connected  
through the local telephone network. Respective

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1 customer service representatives answer the incoming calls over phone units 32 and then enter the information communicated from the viewers into scheduling computer 28 by way of respective terminals 30, each  
5 of which includes a conventional data entry keyboard and monitor.

Land lines 14 typically include coaxial cables which transmit the programs from program unit 12 to receivers 16. Receivers 16 are conventionally coupled with land lines 14 by way of respective cable taps 40.

10 Receivers 16 each include control unit 42 and television 44. Control unit 42 converts a program transmission received from land lines 14 on one of the various transmission channels to an output on a preselected channel for reception by television 24.

15 Control unit 42 is also operable to selectively descramble certain of the transmissions received by way of land lines 14 from central unit 12. Each control unit 42 is equipped to receive decoder signals to detect its specific address signal from computer 26 and in response to descramble the transmission identified by the descrambling signals associated with the address signals.

20 In the preferred method of operating system 10, each subscribing household is provided with a catalog of the programs included in collection 20 along with the associated program identification number by which scheduling computer 28 identifies the program and by which they are labeled and stored in collection 20. Preferably, monthly supplements to the program catalog are provided as new programs are added to collection 20 and new catalogs are periodically issued incorporating the previous

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1       supplements as needed. The program listings in the  
catalog are preferably arranged alphabetically and  
also by subject category to facilitate selection of  
a desired type of program. Collection 20 includes  
5       full-length movies, recordings of previously trans-  
mitted regularly scheduled commercial broadcasts and  
other programs of interest to the subscribers. Each  
subscribing household is preferably provided with a  
confidential identification number in order to prevent  
10      unauthorized ordering and thereby billing of a  
program.

After a viewer has chosen a program, the viewer then uses telephone handset 18 to place a telephone call over the conventional telephone network to the telephone number associated with central unit 12. Customer service representatives answer the incoming telephone calls to whom the viewer communicates the program choice and requested time along with the viewer's name and confidential identification number. The customer service representative then enters this information by way of terminal 30 into computer 28.

In accordance with conventional computer programming techniques well known to those skilled in the art, computer 28 first determines whether the viewer's name and identification number match. If not, this fact is communicated to the representative who informs the viewer that the request cannot be satisfied without a correct match. If the customer name and identification number do match, computer 28 then determines whether the chosen program has been already previously scheduled at the requested time. If such is the case, computer 28 need not reschedule the chosen program, but rather needs only prompt address computer 26 to transmit proper decoding

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1 signals to the viewer's control unit 16 at the requested time to allow the viewer's receiver to descramble the program and to enter the billing information.

5 If the chosen movie has not been previously scheduled at the requested time, computer 28 determines whether a channel is available at the requested time. If yes, computer 28 selects an available channel and schedules this channel for 10 transmission of the chosen program at the requested time. Computer 28 then presents confirmation of this to the customer service representative on the monitor associated with terminal 30 along with the channel number which is then communicated to the 15 viewer.

Computer 28 provides scheduling information as output by way of terminal 34. In the preferred form, an operator reads the output from terminal 34 either presented on an associated monitor or as a hard copy print out. In response, the 20 operator selects the chosen program from collection 20 and inserts into the appropriate VCR included in signal source 36 which is associated with the scheduled channel. That is to say, each transmitter 22 is associated with a specific output channel and the 25 information provided from computer 28 by way of terminal 34 instructs the operator which VCR is to be used for transmitting the chosen program at the requested time. In the alternative, system 10 could be arranged such that any unused signal transmitter 30 22 can be selected and then adjusted to transmit on the scheduled channel. At the requested time the operator activates the appropriate VCR in order to transmit the program which is scrambled and convert-

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1       ed by unit 38 and presented on the selected channel  
to signal combiner 24 and onto land lines 14.

5       Computer 28, upon scheduling the chosen  
program at the requested time, also interacts with  
computer 26 so that computer 26 sends appropriate  
decoder signals at the requested time and during  
transmission of the program to receiver 16 associ-  
ated with the requesting viewer. The decoder sig-  
nals include address signals specific to control  
10      unit 16 associated with the requesting viewer and  
prompts control unit 42 to descramble the chosen  
program in accordance with the descrambler signals  
associated with the address signal. In this way,  
the requesting viewer can view the program on the  
viewer-associated television 44. By scrambling the  
15      transmission, and by not providing a descrambling  
signal to other receivers, subscribers other than  
the requesting viewer are prevented from intelli-  
gible viewing of the chosen program.

20      Upon transmission of the chosen program at  
the requested time, billing and address computer 26  
is programmed to automatically add the specified  
program charge to the requesting viewer's monthly  
bill.

25      If there are no available channels at the  
requested time, computer 28 is preferably programmed  
to determine the nearest available time frame during  
which a channel is available or to determine the  
nearest available time when the chosen program is  
already scheduled for transmission. This informa-  
30      tion is then presented to the customer service  
representative on terminal 30 who in turn communi-  
cates this information to the requesting viewer who  
may thereupon select one of the alternative times.  
For example, if the requesting viewer wishes to see

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1        a very popular program at a certain time, and all of  
the channels are already scheduled for that time,  
none of which include that chosen program, an unused  
channel may be available shortly before or after the  
5        requested time or the chosen program may be already  
be rescheduled at a nearby time whereupon the re-  
questing viewer can select one of these.

10       As discussed above, scheduling computer 28  
is programmed to ensure that the viewer's identifi-  
cation number matches the name of the requesting  
viewer, or the requesting viewer's address, and so  
forth. As a further check, computer 28 can be pro-  
grammed to also include the requesting viewer's  
15       telephone number, and upon being provided with this  
information, can double check this against the  
confidential identification number and the request-  
ing viewer's name and address. This provides addi-  
tional assurance that unauthorized persons do not  
schedule programs which would be billed against  
20       another subscriber's account.

25       As those skilled in the art will appreci-  
ate, the requirement for a customer service repre-  
sentative to answer telephone 32 can be eliminated  
by the provision of a so-called "auto-dial" device  
which would allow the requesting viewer to communi-  
cate directly with scheduling computer 28 by provid-  
ing appropriate encoded signals such as those pro-  
vided by buttons 46 as touch-tone signals from  
telephone handset 18. Such systems are well known  
to those skilled in the art and are commonly used in  
30       banking services whereby customers can conduct  
transactions with their financial accounts. Such  
systems often include voice response systems which  
can be incorporated in computer 28 to provide verbal  
messages by way of synthesized voice or prerecorded

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1       verbal messages. The requesting viewer can respond  
to inquiries by the computer by entering the appropriate codes on push buttons 46. Such an interconnection with computer 28 by way of terminal 30 is  
5       indicated by the dashed lines 48.

10      Those skilled in the art will also appreciate that the information from the requesting viewer can be communicated to central unit 12 by using land lines 14 such as with an interactive cable system. Such systems are well known such as those described in U.S. Patent Nos 4,290,142, 4,408,345, and 4,710,955 which are hereby incorporated by reference.

15      As discussed above in connection with U.S. Patent No. 4,506,387, program collection 20 can include programs stored in electronic memory. If such is preferred, computer 28 can be connected directly with collection 20 as represented by line 50. In addition, collection 20 can be directly coupled with signal sources 36 as illustrated by lines 52. With such an arrangement, the requirement for an operator to physically select the programs from collection 20 and in to insert them in the appropriate VCR is eliminated. That is to say, upon instructions from scheduling computer 28, collection  
20      25       20 is operable to cause the chosen program to be transmitted directly to the appropriate signal source 36 for the scheduled channel at the requested time.

30      While the present invention is discussed in the environment of a conventional CATV system using coaxial cables such as land lines 14, the present invention is also useful in the context wherein land lines 14 are fiber optic cables or telephone lines. Fiber optic cables have the capa-

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1       bility of carrying many more channels than a coaxial  
          cable with repeaters spaced further apart and with  
          somewhat greater immunity to external noise. In  
5       such a system, conventional telephone communication  
          may also be provided over such a fiber optic cable  
          or, in the alternative, a separate key pad, key-  
          board, or the like can be included as part of re-  
          ceiver 16 whereby the requesting viewer can enter  
          data representative of the chosen program and  
10      requested time for transmission over the land lines  
          14 directly to computer 28.

15      A typical cable television system using a  
          coaxial cable as a trunk line may have upwards of  
          fifty channels unused for regularly scheduled trans-  
          missions. With the potential for a thousands of  
          receivers connected to the system, fifty unused  
          channels may not be adequate to supply the demand  
          viewer-chosen program viewing. It should be appre-  
          ciated, however, that in this example, fifty avail-  
20      able channels can still satisfy the program choice  
          demands of many thousands of subscribers. For  
          example, fifty channels transmitting the fifty most  
          popular programs of the day may satisfy up to 80% of  
          the program requests. It would not be unexpected  
          that many subscribers may request the most popular  
25      program. This, coupled with the fact that all of  
          the subscribers will not likely be requesting movies  
          at the same time, may allow fifty available channels  
          to serve many subscribers.

30      Nevertheless, there may be some upper  
          limit as to the number of subscribers that the  
          available channels can adequately serve. In order  
          to provide the optimum service to the subscribers in  
          a system, the present invention encompasses the  
          configuration as illustrated in Fig. 2. A typical

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1       CATV system includes a head end 52 at which the  
transmitted program originates and which in turn  
transmits the programs on the various channels by  
way of land lines 14. In the preferred embodiment  
5       as illustrated in Fig. 2, land lines 14 are further  
designated to include a plurality of sections of  
which sections 54 and 56 are illustrated. Each sec-  
tion 54, 56 includes a respective subset 58 and 60  
of receivers respectively coupled thereto. Each  
10      section 54, 56 and so forth is respectively coupled  
to the remaining portions of land lines 14 at a  
respective node or juncture 62, 64.

15      In the preferred embodiment of the present  
invention, a central unit is provided for each  
subsection. Two such central units 12 and 66 are  
illustrated and are respectively coupled via lines  
68 and 70 with respective sections 54 and 56.  
Furthermore, respective blocking devices 72 and 74  
are provided at junctures 62 and 64 respectively.

20      Blocking devices 72 and 74 are preferably  
low pass filters which allow transmissions from head  
end 52 transmitted at the lower frequency channels  
to pass unimpeded therethrough. Viewer-chosen  
programming is preferably transmitted at the higher  
frequency channels directly to the respective sec-  
tions 54, 56. Blocking devices 72 and 74 prevent  
25      transmission of these higher frequency channels  
beyond their respective sections so that they do not  
interfere with one another. That is to say, each  
program unit 12 and 66 can broadcast viewer-chosen  
programs on the same channel frequencies but the  
30      sections are isolated from one another by the block-  
ing devices.

Sections of land lines 14 can be identi-  
fied and designated as desired by the proper place-

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1       ment of a blocking device such that each program  
unit can adequately serve the program requests of  
the viewers associated with the subset of receivers  
included in each subsection. For example, if a CATV  
5       system has 50,000 subscribers, and it is determined  
that fifty channels can adequately satisfy the  
viewer-chosen program requests of 10,000 viewers,  
five sections of 10,000 receivers each would be  
10      designated with a blocking device installed at the  
junction between each designated section and the  
remaining portions of the land lines. In this way,  
transmissions produced by separate central units on  
the same channels to separate sections would not  
interfere with one another. This arrangement effec-  
15      tively multiplies the number of available channels  
for viewer-chosen programs.

As preferred, central units 12, 66 and so forth, are located in physical proximity with head end 52 to take advantage of already existing equipment. It should be appreciated, however, that even with multiple central units, multiple scheduling computers, billing, and address computers may not be needed. That is to say, a single set of appropriately selected computers can serve all of the central units. Additionally, economy of a scale may dictate that all of the central units use a common program collection 20 in order to minimize the size of the inventory. Furthermore, the various program units may also share a common set of incoming telephone lines for communicating with requesting viewers.

As an alternative, however, and depending upon the configuration of the CATV network and the economics involved, it may be desirable to locate a totally independent and free-standing program unit

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1       physically adjacent its associated section of the  
land lines or physically adjacent another location  
such as the central administrative office of the CATV  
transmission system. That is to say, those skilled  
5       in the art will appreciate that the physical loca-  
tion of the program unit and whether multiple pro-  
gram units can use common equipment is a matter of  
design choice dictated by technology, economics, and  
so forth.

10       Those skilled in the art will also appre-  
ciate that blocking devices 62, 64, and so forth may  
include distribution repeaters or amplifiers which  
are designed to amplify the frequency channels  
emanating from head end, but by their nature inher-  
15       ently block passage of the higher frequency channels  
from the various sections to the remaining portions  
of land lines 14. This can be implemented by coupl-  
ing line 68, immediately "downstream" of the repeater  
nearest juncture 62. Other repeaters downstream  
20       of this blocking repeater receive and amplify all  
the incoming transmissions including the transmis-  
sions from the head end and those injected at junc-  
ture 62.

25       As should now be apparent from the de-  
scription above, the present invention allows a  
requesting viewer to choose a program for viewing at  
a requested time on the television receiver associ-  
ated with the requesting viewer. The convenience  
provided thereby eliminates the need for the viewer  
30       to drive to a video store to pickup a chosen movie  
on video tape and to again repeat the trip to return  
the movie.

          Additionally, the present invention mini-  
mizes the risk that the viewer will be unable to  
view the chosen program at the viewer requested

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1 time. This risk is minimized for two reasons.  
First, the preferred embodiment hereof designates  
sections of the land lines which are matched from a  
capacity standpoint with its associated program unit  
5 in order to satisfy the demands of the viewers  
associated therewith. Secondly, the present invention  
allows as many viewers as are connected to the  
system to choose the same program at the same time.  
This is because once the chosen program is scheduled  
10 for transmission on a particular channel, additional  
viewers can be added simply by transmitting the  
appropriate descrambling signals to the requesting  
viewer's receiver. In this way, many viewers can  
choose the currently most popular program rather  
15 than just a few as determined by the number of  
cassette copies available as with prior art video  
stores.

The present invention also avoids the need  
for premium rental space in which to store a large  
20 inventory of programs and eliminates the many duplications  
of inventory carried by the many video stores in a territory.

Having thus described the preferred embodiments  
of the present invention, the following is  
claimed as new and desired to be secured by Letters  
25 Patent:

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Claims

5                   1. A method of operating a television transmission system using land lines for transmitting television programs for reception by a plurality of receivers coupled with land lines for viewing the programs on the receivers by viewers respectively associated therewith, the system including means for selectively preventing intelligible viewing of certain programs by certain receivers, said method comprising the steps of:

10                 providing a collection of stored programs stored on a medium allowing selective reproduction and real-time transmission of said stored programs over the land lines;

15                 selecting a prospective chosen program from said collection for transmission at a requested time in response to a request therefor from a requesting viewer;

20                 transmitting said chosen program in real-time over the land lines at said requested time for reception by and viewing on a receiver associated with said requesting viewer;

25                 and

                   preventing intelligible viewing of said chosen program at said requested time on receivers other than said receiver associated with said requesting viewer.

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- 1           2. The method as set forth in claim 1,  
the system including --  
              scrambler means operably coupled with said land  
              lines for selectively scrambling the  
5           transmission of certain of the program  
              transmissions in order to prevent intelligible  
              viewing thereof on the receivers,  
              a plurality of control units respectively  
              corresponding to and operably associated  
10          with the receivers and operably coupled  
              with the land lines, each control unit  
              being operable for receiving decoder  
              signals and in response thereto for selectively  
              descrambling certain ones of the  
15          program transmissions for allowing intelligible  
              viewing thereof on the associated receiver, and  
              decoder signal means operably coupled with the  
              land lines and operable for selectively  
              transmitting decoder signals for reception  
20          by the receivers in order to allow intelligible  
              viewing of certain ones of the programs on selected ones of the receivers, said method further including the steps of --  
25          scrambling the transmission of said chosen program in order to prevent intelligible viewing thereof on the receivers, and  
              transmitting decoder signals for receipt by  
              said receiver associated with said requesting viewer in order to allow intelligible viewing of said chosen program thereon.

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1                   3. The method as set forth in claim 1,  
the system including means for simultaneously trans-  
mitting a plurality of programs on a respective  
plurality of identifiable channels, the receivers  
5                   being operable for tuning to a selected channel,  
said method further including the steps of --  
transmitting said chosen program during said  
requested time over a selected channel,  
and  
10                 communicating the identity of said selected  
channel only to said requesting viewer.

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1           4. The method as set forth in claim 2,  
the system including means for transmitting a plu-  
rality of programs on a respective plurality of  
identifiable channels, the control units being oper-  
5           able for tuning to a selected channel, the decoder  
signals including address signals respectively  
specific to the control units and descrambler sig-  
nals respectively associated with the address sig-  
nals and respectively specific to identify selected  
10          transmissions each control unit being responsive to  
specific address signals and the descrambler signals  
associated therewith for descrambling program trans-  
missions on the channels identified by the descram-  
bler signals, said method further including the  
15          steps of --

              selecting a channel for transmission,  
              transmitting said chosen program during said  
              requested time on said selected channel,  
              communicating the identity of said selected  
              channel only to said requesting viewer,  
20          transmitting address signals specific to the  
              control unit associated with the request-  
              ing viewer's receiver and transmitting  
              associated descrambler signals specific to  
              identify said selected channel.

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- 1               5. The method as set forth in claim 1,  
further including the steps of --  
              identifying a section of the land lines having  
              a subset of receivers operably coupled  
5               thereto wherein said subset includes a  
              plurality of receivers less than the total  
              number of receivers included in the sys-  
              tem, and remaining portions of the land  
              lines having a plurality of receivers  
10              other than said subset coupled thereto,  
              transmitting said chosen program over said  
              section of the land lines,  
              identifying a juncture between said section and  
              said remaining portion, and  
15              preventing transmission of said chosen program  
              beyond the juncture from said section to  
              said remaining portion by use of a block-  
              ing device located at said juncture.
- 20              6. The method as set forth in claim 1,  
further including the steps of --  
              providing computer means operable for receiving  
              from said requesting viewer encoded sig-  
              nals representative of said chosen pro-  
              gram, said requested time, and the iden-  
25              tity of said receiver associated with said  
              requesting viewer,  
              said selecting step including the step of  
              selecting said chosen program from said  
              collection in response to said encoded  
30              signals from said requesting viewer.
7. The method as set forth in claim 1,  
              said encoded signals including telephone touch-tone  
              signals.

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8. The method as set forth in claim 6,  
further including the step of providing said computer  
means with voice interaction capability and using  
said computer for providing voice communication to  
said requesting viewer.

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9. The method as set forth in claim 1,  
further including the steps of providing scheduling  
computer means operable for scheduling multiple  
program choices and multiple requested times.

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10. The method as set forth in claim 9,  
further including the steps of --  
providing computer means for providing billing  
information correlated with the requesting  
viewer's chosen program, and  
providing a bill to said requesting viewer  
corresponding to said chosen program.

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11. The method as set forth in claim 1,  
further including the step of providing electronic  
memory means having said collection stored therein.

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12. The method as set forth in claim 1,  
the land lines including coaxial cables.

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13. The method as set forth in claim 1,  
the land lines including fiber optic cables.

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- 1           14. In a television transmission system  
      using land lines for transmitting programs for  
      reception by a plurality of television receivers  
      coupled with the land lines for viewing of the  
5        programs on the receivers by viewers respectively  
      associated therewith, and including communicating  
      means for communicating information as encoded  
      signals over the land lines from said viewers, the  
      improvement comprising:
- 10        a collection of stored programs stored on a  
          medium allowing selective reproduction and  
          real-time transmission over the land lines  
          for reception and viewing thereof by  
          selected receivers;
- 15        computer means operably coupled with the com-  
          municating means for receiving encoded  
          signals from a requesting viewer, said  
          encoded signals being representative of a  
          requesting viewer's choice of a program  
          chosen from said collection and said  
          requesting viewer's requested time for  
          viewing of said chosen program on a re-  
          ceiver associated with said requesting  
          viewer and for providing output informa-  
          tion representative thereof;
- 20        selecting means operably associated with said  
          collection and said computer means and  
          responsive to said output information for  
          selecting said chosen program from said  
          collection; and
- 25        transmitting means operably associated with and  
          responsive to said selecting means for  
          transmitting said chosen program over the  
          land lines at said requested time for  
          reception by and viewing on said request-  
          ing viewer's receiver.
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15. The apparatus as set forth in claim  
14, the communicating means including telephone  
lines, the encoded signals including touch-tone  
signals, said computer means including means for  
providing voice communication to said requesting  
viewer over the telephone lines.

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16. The apparatus as set forth in claim  
15, the system including means for transmitting  
programs on a respective plurality of channels,  
said computer means including means for sche-  
duling one of the channels for transmis-  
sion of said chosen program thereon and  
including means for providing voice com-  
munication over the telephone lines iden-  
tifying the channel on which said chosen  
program is to be transmitted to the re-  
questing viewer.

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- 1           17. In a television transmission system  
          using land lines for transmitting programs for  
          reception by a plurality of television receivers  
          coupled with land lines for viewing of the programs  
5           on the receivers by viewers respectively associated  
          therewith, the system further including communicat-  
          ing means for receiving information over land lines  
          from the viewers, the land lines including a section  
          thereof having a subset of the receivers coupled  
10          therewith wherein said subset includes a plurality  
          of receivers less than the total number of receivers  
          included in the system, the remaining portion of the  
          land lines having a plurality of receivers other  
          than the subset coupled therewith, the section and  
15          the remaining portion being coupled with one another  
          at a juncture, the improvement comprising:  
            a collection of stored programs stored on a  
            medium allowing selective reproduction and  
            real-time transmission thereof over the  
            land lines for reception and viewing  
20          thereof by selected receivers;  
            receiving means operably associated with the  
            communicating means for receiving informa-  
            tion from a requesting viewer, said infor-  
            mation including a requesting viewer's  
25          choice of a program chosen from said  
            collection and a requested time for view-  
            ing of said program on a receiver associ-  
            ated with said requesting viewer, said  
            associated receiver being included in the  
            subset of receivers;  
30          selecting means operably associated with said  
            collection and operably associated with  
            and responsive to said receiving means for

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- 1           selecting said chosen program from said collection;
- 5           transmitting means operably associated with said selecting means and coupled with the subsection of the land lines for transmission of said chosen program at said requested time for reception by and viewing one on said associated receivers; and
- 10          blocking means located in the vicinity of the juncture for preventing transmission of the chosen program therebeyond from the section into the remaining portions of the land lines.
- 15          18. The apparatus as set forth in claim 17, the system including means for simultaneously transmitting selected programs over a respective plurality of channels included in a specified group of channels,
- 20          said transmitting means including means for transmitting said chosen program on a selected channel other than the channel included in said selected group of channels,
- 25          said blocking means including structure allowing passage of programs being transmitted on the channels included in the selected group and structure for preventing passage of transmissions on said selected channel from the section to the remaining portion
- 30          of the system.

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19. The apparatus as set forth in claim  
18, said selected channel being at a relatively  
higher frequency than the channels in the specified  
group.

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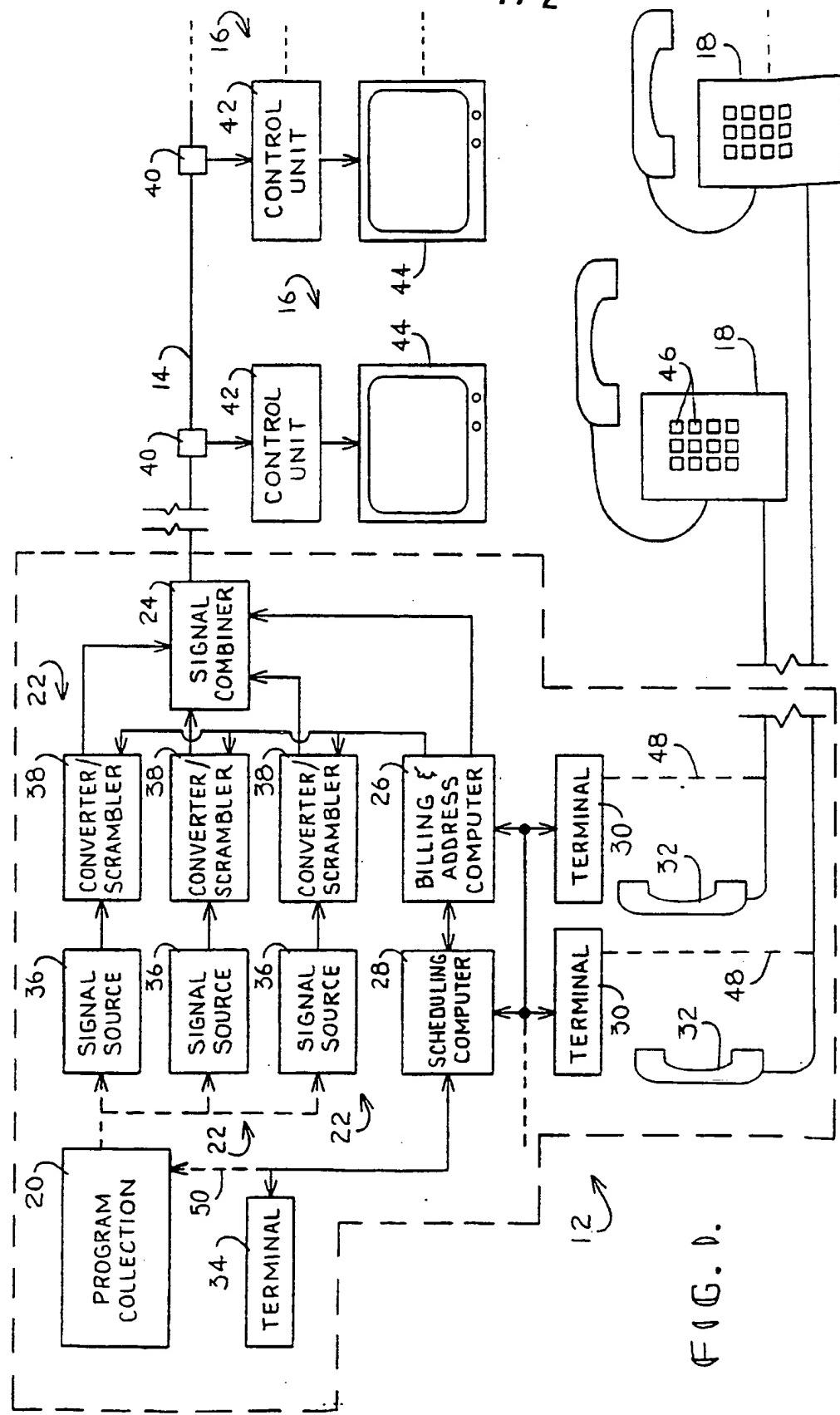


FIG. 1.

**SUBSTITUTE SHEET**

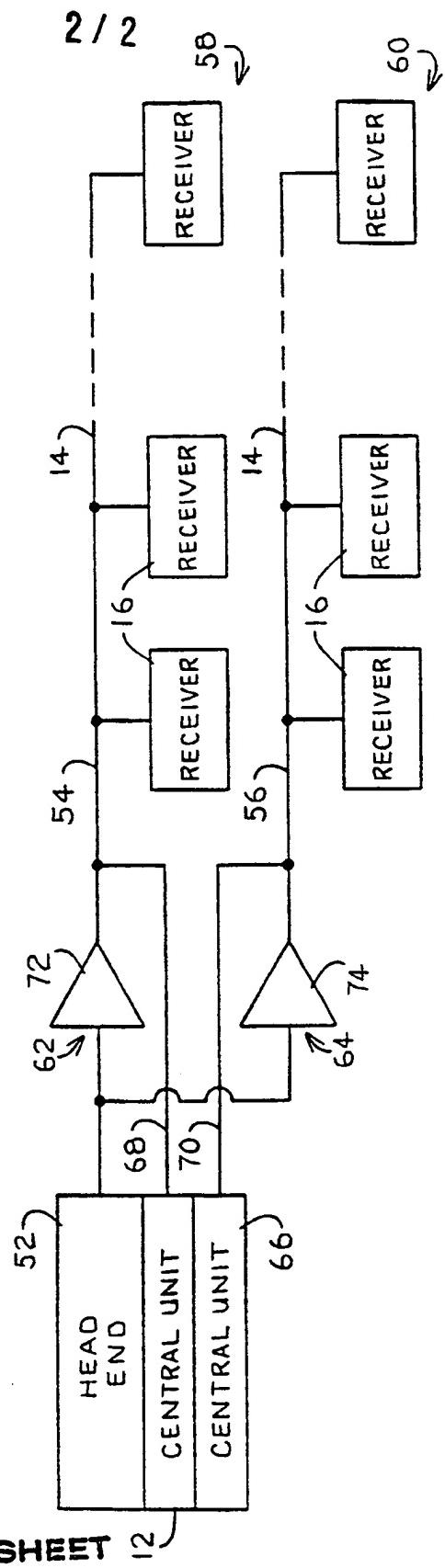


FIG. 2.

**INTERNATIONAL SEARCH REPORT**

International Application No PCT/US89/02507

I. CLASSIFICATION OF SUBJECT MATTER (If several classification symbols apply, indicate all) <sup>a</sup>		
According to International Patent Classification (IPC) or to both National Classification and IPC		
INT. CL. 4    H04N 7/167	U.S. CL. 380/10	
II. FIELDS SEARCHED		
Minimum Documentation Searched <sup>b</sup>		
Classification System :	Classification Symbols	
U.S.	358/85,86 380/3,5,7,10 455/3,4,5,6	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched <sup>c</sup>		
III. DOCUMENTS CONSIDERED TO BE RELEVANT <sup>d</sup>		
Category <sup>e</sup>	Citation of Document, <sup>f</sup> with indication, where appropriate, of the relevant passages	, Relevant to Claim No. <sup>g</sup>
A	US, A, 4,251,691 Published 17 February 1981, Kakihara et al.	1,14,17
Y	US, A, 4,381,522 Published 26 April 1983, Lambert, abstract.	1-19
A	US, A, 4,710,955 Published 01 December 1987, Kauffman.	1,14,17
A, P	US, A, 4,761,684 Published 02 August 1988, Clark et al.	1,14,17
Y, P	US, A, 4,763,191 Published 09 August 1988, Gordan et al., abstract.	1-19
A, P	US, A, 4,785,472 Published 15 November 1988, Shapiro.	1,14,17
<p><sup>a</sup> Special categories of cited documents: <sup>1-3</sup></p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority (claims) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p><sup>b</sup> "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>"S" document member of the same patent family</p>		
IV. CERTIFICATION		
Date of the Actual Completion of the International Search:	Date of Mailing of this International Search Report <sup>i</sup>	
08 August 1989	06 SEP 1989	
International Searching Authority <sup>j</sup>	Signature of Authorized Officer <sup>k</sup>	
ISA/US	Bernard Earl Gregory Bernard Earl Gregory	

International Application No. PCT/US89/02507

III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)

Category	Citation of Document, <sup>1a</sup> with indication, where appropriate, of the relevant passages <sup>1b</sup>	Relevant to Claim No <sup>1c</sup>
Y, P	US, A, 4,792,849 Published 20 December 1988, Mc Calley et al., abstract.	1-19